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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/653,516   | 09/02/2003  | Peter W. Robinson    | 101856-201          | 3878             |
| 27267  | 7590        | 07/13/2006           | EXAMINER            |                  |
| WIGGIN AND DANA LLP<br>ATTENTION: PATENT DOCKETING<br>ONE CENTURY TOWER, P.O. BOX 1832<br>NEW HAVEN, CT 06508-1832 |             |                      | BERGIN, JAMES S     |                  |
|  |             | ART UNIT             | PAPER NUMBER        |                  |
|  |             |                      | 3641                |                  |

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/653,516             | ROBINSON ET AL.     |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | James S. Bergin        | 3641                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 5/1/2006.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 17 and 19-22 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-16, 18 and 23 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 02 September 2003 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Election/Restrictions***

1. Applicant's election with traverse of Species A and claims 1-15, 18 and 23 in the reply filed on 5/1/2006 is acknowledged, with generic claim 16 also being examined. Consequently, claims 17, 19, 20, 21 and 22 are withdrawn by the examiner as being non-elected by the applicants in response to the restriction requirement.
2. The traversal is on the ground(s) that "*examining all the claims and species A and B will not pose an undue burden on the examiner, especially since the examiner has already examined claims 1-22 and rejected the same in this office action*". This is not found persuasive because continued examination and further searching of claims directed to the non-elected species A is judged to be excessively burdensome and would require additional class/ subclass and text searching in USPAT, USPGPUB, USOCR, EPO, JPO, DERWENTS databases. Although the examiner makes every attempt to do a complete search when the case is first examined, amendments to the claims and/or further consideration of the issues often require the examiner to expand the search after a response to the first action has been received.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 4 (as amended) is rejected under 35 U.S.C. 112, first paragraph, because the specification (see applicants' specification, page 13, lines 16-18), while being enabling for the density of a projectile (post sintering) to be theoretically lower than the green density by an amount associated with the lost lubricant, does not reasonably provide enablement for the projectile of claim 1, consisting essentially of 35% ferrotungsten and 3% lubricant to be transformed by sintering into a projectile of about "30% ferrosungsten". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. At most, the specification enables a person skilled in the art to make a projectile of about 32% ferrotungsten from the projectile of claim 1 that consists essentially of 35% ferrotungsten powder and 3% lubricant.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 4-6, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In amended claim 4, the limitation, "*such that the density of the slug produced by the compacting and sintering is about 30 percent ferrotungsten*" is not understood because the percentage composition of the slug is not a proper measure of its density, density more conventionally being measured in units such as g/cc. Furthermore, the composition has already been claimed as consisting essentially of up to 35 percent

ferrotungsten in claim 1. Is the applicant attempting to claim the finished (post compacting and sintering) as consisting essentially of about 30 percent ferrotungsten?

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Mravic et al. (US 5,399,187 A; hereinafter “Mravic”).

Regarding claim 16, Mravic discloses a method of forming a lead-free projectile consisting essentially of metallic powder and a lubricant (col. 2, lines 18-62; col. 4, lines 18-36) compacting the mixture and sintering at a temperature between 180 and 900 degrees C (col. 6, lines 6-36). Mravic’s projectile is inherently capable of being fired from a ballistic tool and would inherently impart kinetic energy to at least temporarily deform, to some degree, a target struck by Mravic’s projectile. It is noted that the applicants’ are not claiming that the projectile of the instant invention strikes clinker built up on the inside of a kiln.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-14, 18, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. (US 5,399,187 A; hereinafter "Mravic") in view of Lowden et al. (US 5,760,331 A; hereinafter "Lowden").

Regarding claims 1, 3, 11 and 23 (and in as much as claim 4 can be understood in the light of the 112 1<sup>st</sup> and 2<sup>nd</sup> paragraph rejections outlined above), Mravic discloses a method of forming a lead-free projectile consisting essentially of metallic powder mixture of powdered ferrotungsten, powdered iron, and a lubricant (col. 2, lines 18-62; col. 4, lines 18-36), compacting the mixture and sintering at a temperature between 180 and 900 degrees C for 2 hours (col. 6, lines 6-36). Mravic's projectile is inherently capable of being fired from a ballistic tool and would inherently impart kinetic energy to at least temporarily deform, to some degree, a target struck by Mravic's projectile. It is noted that the applicants' are not claiming that the projectile of the instant invention strikes clinker built up on the inside of a kiln. Mravic does not specifically disclose the precise percentages of the projectiles constituent materials, except to say that the proportions of the metal powders are such that they would have the density of lead if there were no porosity after sintering. Lowden discloses a sintered lead-free projectile, the frangibility of the projectile being determined at least by controlling the ratio of its constituent materials (col. 6, lines 27-50).

In view of Lowden, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to control the frangibility of Mravic's projectile by controlling the ratio of its constituent materials. It would further have been obvious to one having ordinary skill in the art at the time the invention was made to select up to 35% ferrotungsten, up to 3% lubricant, the balance being iron, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 2, Mravic discloses compacting at a pressure of 100,000 psi (col. 6, lines 12-13).

Regarding claims 4-8, Mravic does not disclose the particle size of the ferrotungsten or iron powders. Lowden discloses that the particle size selected will influence the frangibility of a sintered lead-free projectile (col. 6, lines 27-50) and so influence the porosity and fracture toughness of the projectile. In view of Lowden, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to vary the frangibility of Mravic's projectile by selecting the particle size of the powdered metals so as to produce a projectile with any desired porosity and fracture toughness. It would further have been obvious to one of ordinary skill in the art at the time that the invention was made to select the claimed metal particle size ranges of the applicants' claims 5-8, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claims 9 and 10, Mravic discloses that the powders are compacted using pressures of 100,000 psi (col. 6, lines 11-15) but does not specifically state that the compact has transverse rupture strength in excess of 800 psi or 1050 psi. However, given Mravic's disclosed 100,000 psi compressing pressure, the transverse rupture strength of Mravic's compact is inherently in excess of 800 psi or 1050 psi. In support of this inherency it is noted that the applicants' compacting is performed at a pressure of between about 20,000 psi and about 120,000 psi to produce a compact with a transverse rupture pressure of between 800 psi and 1050 psi.

Regarding claim 12, Mravic discloses that the frangibility of the projectile can be controlled by suitably varying the sintering time and/ or the sintering temperature (col. 5, lines 5-9). Lowden discloses controlling the frangibility of a sintered lead-free projectile (col. 6, lines 27-50) so as to produce a projectile with desired fracture toughness or other physical property. In view of Lowden, it would have been obvious to one of ordinary skill in the art at the time that the invention was made to vary the frangibility of Mravic's projectile by choice of materials, consolidation technique, particle size etc. so as to produce a projectile with any desired fracture toughness, including a projectile frangibility that would result in a fragment pattern such as that recited in claims 12 and 19.

Regarding claim 13, Mravic discloses disposing an integrally bonded metallic jacket (col. 5, lines 38-40) on the projectile so as to protect the gun barrel from damage during firing (col. 5, lines 28-30). The integrally bonded metallic jacket of Mravic's projectile would inherently be effective to engage the rifling of the gun barrel.

Regarding claim 14, Mavric's projectile can be lubricant free (col. 2, lines 41-45) or is inherently essentially lubricant free after the sintering process (applicants' admit that the sintering process removes the lubricant (see specification page 9, lines 3-4).

Regarding claim 18, Mravic discloses a method of forming a lead-free projectile as discussed above with regard to claim 1. Mravic discloses that the powders are compacted using pressures of 100,000 psi (col. 6, lines 11-15) but does not specifically state that the compact has a transverse rupture strength in excess of 800 psi. However, given the disclosed 100,000 psi compressing pressure, the transverse rupture strength of Mravic's compact is inherently in excess of 800 psi.

11. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mravic et al. (US 5,399,187 A; hereinafter "Mravic") in view of Lowden et al. (US 5,760,331 A; hereinafter "Lowden") as applied to claim1 above, and further in view of Harris et al. (US 6,038,978 A) or Dippold et al. (US 5,824,944).

Mravic does not specifically disclose that the lead-free projectile is dimensioned to be expelled from an eight-gauge industrial tool. However, Harris et al. discloses a projectile sized for use with an eight-gauge industrial tool (col. 2, lines 40-45). Dippold et al. discloses a lead free projectile sized for use with an eight-gauge industrial tool. In view or either Harris et al or Dippold et al., it would have been obvious to one of ordinary skill in the art at the time that the invention was made to size Mravic's projectile for use with an eight-gauge industrial tool, because to do so would only involve the

dimensioning a projectile for use in a ubiquitously well known caliber of industrial tool at the time that the invention was made.

***Response to Arguments***

12. Applicant's arguments filed 5/1/2006 have been fully considered but they are not persuasive. Regarding the arguments concerning the rejection of claim 16 as being anticipated by Mravic et al. (5,399,187), Mravic's projectile is inherently capable of being fired from a ballistic tool and would inherently impart kinetic energy to at least temporarily deform, to some degree, a potential target struck by Mravic's projectile. It is noted that the applicants' are not claiming that the projectile of the instant invention strikes clinker built up on the inside of a kiln. Claims 20, 21 and 22 are withdrawn by the examiner as being non-elected by the applicants.

13. Regarding the arguments concerning the obviousness rejection of claim 1 over Mravic et al. (5,399,187) in view of Lowden et al. (5,760,331), it is again noted that Mravic's projectile is inherently capable of being fired from a ballistic tool and would inherently impart kinetic energy to at least temporarily deform, to some degree, a potential target struck by Mravic's projectile. It is noted that the applicants' are not claiming that the projectile of the instant invention strikes clinker built up on the inside of a kiln. The examiner reminds the applicants' that the examiner has never taken the position that Mravic et al. anticipates claim 1.

14. Regarding the arguments concerning the obviousness rejection of claim 15 over Mravic et al. (5,399,187) in view of Lowden et al. (5,760,331), and further in view of Harris et al. or Dippold et al., the applicants are reminded that the examiner relies on

either Harris et al. or Dippold et al. only for a teaching of sizing a projectile for use with a ubiquitously well known caliber of industrial tool such as an eight-gauge industrial tool.

15. In response to applicant's argument that the applicants' "*frangible slug is effective to impart kinetic energy to deform a target*", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. It is noted that the applicants' claims are directed to a "**Method of manufacturing a frangible slug**" as opposed to the alternate invention of "**Method of firing a frangible slug at a target, such as a kiln to remove clinker buildup therefrom**".

#### *Conclusion*

16. Applicant's amendment necessitated the new ground(s) of rejection (112 1<sup>st</sup> paragraph rejection of claim 4) presented in this Office action.

**THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

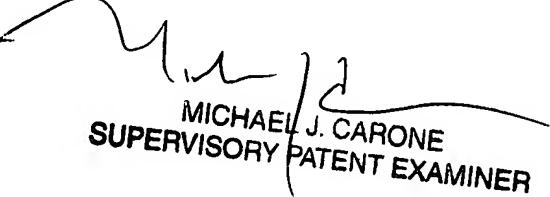
17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Bergin whose telephone number is 571-272-6872. The examiner can normally be reached on Monday - Wednesday and Friday, 8.30 - 5.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone can be reached on 571-272-6873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



J. S. Bergin



MICHAEL J. CARONE  
SUPERVISORY PATENT EXAMINER